

## Topic: SULFUR DIOXIDE

## 0.0 OVERVIEW

## 0.1 LIFE SUPPORT

This overview assumes that basic life support measures have been instituted.

## 0.2 CLINICAL EFFECTS

## 0.2.1 SUMMARY OF EXPOSURE

- A. Sulfur dioxide is extremely irritating to the mucosa of the nasopharynx and respiratory tract. Bronchoconstriction, cough, sneezing, wheezing, upper airway edema or obstruction, cyanosis, and pulmonary edema may occur. Reactive airway disease, obstructive and restrictive lung disease, or chronic bronchitis may develop in victims who survive exposure to high concentrations. Conjunctival irritation may be seen. Serious eye injury or dermal frostbite injury may occur after direct contact with liquified sulfur dioxide.

## 0.2.3 HEENT

- A. CONJUNCTIVITIS: Eye irritation may occur. Severe corneal damage may be seen after direct contact with liquified sulfur dioxide.
- B. NASOPHARYNGEAL IRRITATION: Irritation of the nose, nasopharynx, and glottis is common. Edema may cause upper airway obstruction.

## 0.2.5 RESPIRATORY

- A. RESPIRATORY TRACT IRRITATION: Cough, dyspnea, chest discomfort, bronchoconstriction, cyanosis, and pulmonary edema may occur. Pneumonia is a common complication. Victims surviving a serious inhalation injury may develop reactive airway disease, obstructive and restrictive lung disease, or chronic bronchitis.

## 0.2.7 GASTROINTESTINAL

- A. VOMITING: Nausea, vomiting, and abdominal pain may be seen.

## 0.2.15 DERMATOLOGIC

- A. FROSTBITE: Direct contact with liquified sulfur dioxide could cause frostbite injury.

## 0.3 LABORATORY

- A. Baseline chest x-ray and arterial blood gases should be obtained in victims with significant inhalation exposure or symptoms of respiratory tract irritation.

## 0.4 TREATMENT OVERVIEW

## 0.4.1 SUMMARY

- A. Move victims from the toxic environment and administer 100% humidified supplemental oxygen with assisted ventilation as required. Endotracheal intubation or tracheostomy may be needed if upper airway obstruction is present. Inhaled sympathomimetic bronchodilators can be used for bronchospasm. Steroids are controversial. Antibiotics may be useful for pulmonary

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infectious complications. Exposed eyes should be copiously irrigated. Rewarming and a variety of topical treatments are useful for frostbite injury.

## 0.4.3 INHALATION EXPOSURE

- A. DECONTAMINATION: Move patient to fresh air. Monitor for respiratory distress. If cough or difficulty in breathing develops, evaluate for respiratory tract irritation, bronchitis, or pneumonitis. Administer 100 percent humidified supplemental oxygen with assisted ventilation as required.
- B. Administer 100% supplemental humidified oxygen with assisted ventilation as required.
- C. Endotracheal intubation or tracheostomy may be needed if upper airway obstruction occurs.
- D. Inhaled sympathomimetic bronchodilators may be useful to treat bronchospasm.
- E. Steroid use is controversial. Antibiotics may be useful for pulmonary infectious complications.
- F. PULMONARY EDEMA (NONCARDIOGENIC): Maintain ventilation and oxygenation with close arterial blood gas monitoring. Early use of PEEP and mechanical ventilation may be needed to maintain pO<sub>2</sub> greater than 50 mmHg with FIO<sub>2</sub> less than 60%.

## 0.4.4 EYE EXPOSURE

- A. DECONTAMINATION: Exposed eyes should be irrigated with copious amounts of tepid water for at least 15 minutes. If irritation, pain, swelling, lacrimation, or photophobia persist, the patient should be seen in a health care facility.

## 0.4.5 DERMAL EXPOSURE

- A. Rewarming and a variety of topical treatments are indicated for frostbite injury. SEE MAIN SECTION FOR MORE INFORMATION.

## 0.5 RANGE OF TOXICITY

- A. The minimum lethal human exposure is 400 ppm for 1 minute. An odor or taste is noticed at 3 to 5 ppm, throat and conjunctival irritation and lacrimation begin at 8 to 12 ppm and become severe at 50 ppm.